

REMARKS

This Amendment is submitted in reply to the non-final Office Action mailed on September 8, 2009. No fee is due in connection with this Amendment. The Director is authorized to charge any fees that may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 3712161-88 on the account statement.

Claims 13-29, 31-33, 35-41 and 44-52 are pending in this application. Claims 1-12, 30, 34 and 42-43 were previously canceled. In the Office Action, Claims 13-29, 31-33, 35-41 and 44-52 are rejected under 35 U.S.C. § 103. In response, Claim 13 has been amended. The amendments do not add new matter. In view of the amendments and/or for the reasons set forth below, Applicants respectfully submit that the rejections should be withdrawn and the application now passed to allowance.

In the Office Action, Claims 13-29, 31-33, 35-37, 44-45 and 49-52 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,300,398 to Jialanella ("*Jialanella*") in view of the publication on Polywax Polyethylene ("*Baker-Hughes*"). In contrast, Applicants respectfully traverse the rejection for at least the reasons set forth below.

Applicants have amended independent Claim 13 to recite, in part, a polymer mixture consisting of at least one synthetic first polymer P(i) and at least one second polymer P(j). The first polymer P(i) has a degree of polymerisation $DP(P(i)) > 500$ and at least one type of crystallisable sequences A having a degree of polymerisation $DPs(P(i))$ of these sequences > 20 . The second polymer P(j) is made up of the same monomer units as the sequences A of P(i) and the degree of polymerisation $DP(P(j))$ of P(j) is $20 < DP(P(j)) < 500$. The amendments are supported, for example, in the U.S. publication 2006/0148960 at paragraphs 25-37.

Applicants have also amended independent Claim 13 to recite, in part, that the polymer mixture in the form of a thermoplastic melt is prepared by a means selected from the group consisting of a double-screw extruder, a single-screw extruder with mixing section, a Buss-Ko kneader and combinations thereof. Independent Claim 13 further recites, in part, a second polymer P(j) made up of the same monomer units as the sequences A of P(i) having a degree of polymerisation $DP(P(j))$ of P(j) of $20 < DP(P(j)) < 500$, a polydispersivity < 30 P(j) and a degree

of branching $< 5 \times 10^{-2}$. In contrast, Applicants respectfully submit that the cited references alone or in combination fail to disclose or suggest each and every element of independent Claim 13.

Embodiments of the present disclosure are directed to polymer mixtures consisting of least one synthetic first polymer P(i) and at least one second polymer P(j) having specific characteristics wherein the structural parameters of the two polymers are coordinated in such a way that an improved polymeric material is obtained. Nucleating agents are excluded by the claimed polymer mixture. The improved polymer mixture is easier to process and provides improved mechanical properties and improved thermal properties as compared to the first polymer alone under suitable conditions for producing the polymer mixture.

Jialanella and *Baker-Hughes* fail to disclose or suggest a polymer mixture consisting of at least one synthetic first polymer P(i) and at least one second polymer P(j) as required by independent Claim 13. *Jialanella* and *Baker-Hughes* also fail to disclose or suggest a polymer mixture comprising a second polymer P(j) made up of the same monomer units as the sequences A of P(i) having a degree of polymerisation DP(P(j)) of P(j) of $20 < DP(P(j)) < 500$, a polydispersity < 30 P(j) and a degree of branching $< 5 \times 10^{-2}$ as required by independent Claim 13. In addition, *Jialanella* and *Baker-Hughes* fail to disclose or suggest that the polymer mixture in the form of a thermoplastic melt is prepared by a means selected from the group consisting of a double-screw extruder, a single-screw extruder with mixing section, a Buss-Ko kneader and combinations thereof as required by independent Claim 13.

"One way for a patent applicant to rebut a prima facie case of obviousness is to make a showing of 'unexpected results,' i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected." *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995). Applicants have surprisingly found that a synergistic interaction of at least two specifically recited polymers takes place in the absence of nucleating agents. The claimed polymer mixtures result in a macromolecular network that is created by a kind of crystallization where the resulting crystals are built from the polymer macromolecules as well as wax molecules such that an improved processability can be combined with improved mechanical properties.

Jialanella uses compositions comprising a homogeneous ethylene interpolymer, a wax and a nucleating agent. See *Jialanella*, column 1, lines 57-59. The deleterious effect of the wax,

which is a high crystallinity material, is overcome by using an effective amount of nucleating agent. See *Jialanella*, column 1, lines 60-64. From this, the skilled artisan would understand that by adding wax the upper use temperature and the onset of crystallization temperature can be improved towards higher values and that the deleterious negative effect of the wax on elongational properties can be overcome by simultaneously using an appropriate amount of nucleating agent. As a result, this would confirm the skilled artisan's understanding that wax as a short chain molecule has an adverse effect on elongational properties as it is clear that the good elongational properties of polymers are a direct consequence of the unique feature of polymers: the long chain. The fact that the nucleating agent increases the elongation at break by a factor of at least four, as is pointed out in column 2, lines 20-23, is very surprising indeed and comprises the essential teaching of *Jialanella*.

With the claimed polymer mixtures, the opposite was found of what is expected from reading *Jialanella*. The elongational properties were not deteriorated due to addition of wax and processability is improved. Moreover, the skilled artisan would find no guidance in *Jialanella* to realize the benefit of compatible waxes for injection molding applications of the claimed polymer mixture where, without the use of a nucleating agent and after sufficient mixing when the wax molecules are evenly distributed within the polymer and some essential structural requirements of the polymer and wax are fulfilled, a synergistic interaction of the wax and the polymer takes place upon cooling. This results in a macromolecular network that is created by a kind of crystallization where the resulting crystals are built from the polymer macromolecules as well as the wax molecules such that an improved processability can be combined with improved mechanical properties.

Jialanella further fails to disclose the specific mixing methods in accordance with Claim 13. Instead, the liquids of *Jialanella* are mixed by a Haake mixer or a Banbury mixer. See *Jialanella*, column 20, line 42. The mixers are conventional batch mixers like the Brabender chamber kneader used in a comparative example in the pending application. Such mixers are known to be on the low end side regarding mixing performance. For mixing of systems that are difficult to mix (e.g. systems comprising long and short chain polymers) unusual and impractical long mixing times are required and even at longest times the obtainable results are limited.

According to *Jialanella*, the liquids are mixed for just 2 minutes. See *Jialanella*, column 20, line 64 to column 21, line 1.

Baker-Hughes discloses a polyethylene wax and suggests that it is suitable in the field of polystyrene foams. As the wax and the polystyrene polymer are chemically incompatible, no molecularly dispersed mixture can be obtained and heterocrystallisation is impossible. The skilled artisan would understand that in such mixtures a migration of the wax to the surface of the polymer blend is expected as it is typically (but in most cases undesired) the case for additives that should improve processability. This effect also becomes obvious from the fact that the waxes may be used for mold-release, which is due to a layer of wax at the surface of molded articles. Moreover, the skilled artisan would find that the essential specific requirements of the mixing process of the claimed polymer mixture are not disclosed or suggested by *Baker-Hughes*.

What the Patent Office has done is to rely on hindsight reconstruction of the claimed invention. Applicants respectfully submit that it is only with a hindsight reconstruction of Applicants' claimed invention that the Patent Office is able to even attempt to piece together the teachings of the prior art so that the claimed invention is allegedly rendered obvious. Instead, the claims must be viewed as a whole as defined by the claimed invention and not dissected into discrete elements to be analyzed in isolation. *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1548, 220 USPQ 303, 309 (Fed. Cir. 1983); *In re Ochiai*, 71 F.3d 1565, 1572, 37 USPQ2d 1127, 1133 (Fed. Cir. 1995). One should not use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d at 1075. (Fed. Cir. 1988).

Finally, Applicants wish to clarify the teaching of Figure 3 of the pending application. Applicants respectfully submit that Figure 3 does not show that mixing time is important. Rather, Figure 3 shows that the type of mixer used and the amount of P(j) are the most important for % elongation at break. As a result, Applicants do not believe that a time limitation is necessary.

In sum, the cited references alone or in combination fail to disclose or suggest each and every element of independent Claim 13. Moreover, the cited references fail to even recognize the advantages, unexpected benefits and/or properties of the polymer mixture in accordance with the present claims. For at least the reasons discussed above, Applicant respectfully submits that

independent Claim 13, along with the claims that depend from Claim 13, are novel, nonobvious and distinguishable from the cited references.

Accordingly, Applicants respectfully request that the rejection of the claims under 35 U.S.C. §103 be withdrawn.

Claims 38-41 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Jialanella* and *Baker-Hughes* in further view of the publication to Kokko ("*Kokko*"). Claims 46-48 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Jialanella* and *Baker-Hughes* in further view of the publication to Eastman ("*Eastman*"). Applicants respectfully submit that the patentability of Claim 13 as previously discussed renders moot the obviousness rejections of Claims 38-41 and 46-48 that depend from Claim 13. In this regard, the cited art fails to teach or suggest the elements of Claims 38-41 and 46-48 in combination with the novel elements of Claim 13.

The Patent Office rejects Claims 13-29, 31-33, 35-41 and 44-52 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 13-28 of copending U.S. Patent Application No. 11/577,250. For purposes of advancing the prosecution of this application, Applicants have elected to overcome such rejection through the enclosed Terminal Disclaimer. Such election shall not be deemed an admission as to the propriety or accuracy of the Office Action's conclusions or rejections.

Accordingly, Applicants respectfully submit that the provisional rejection of the pending claims under obviousness-type double patenting has been overcome.

For the foregoing reasons, Applicants respectfully request reconsideration of the above-identified patent application and earnestly solicit an early allowance of same. In the event there remains any impediment to allowance of the claims which could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate such an interview with the undersigned.

Respectfully submitted,

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